NEW PRODUCTS AND PROCESSES

A Guide to Recent Technical Reports Available From Federal Agencies

U.S. DEPARTMENT OF COMMERCE
AREA REDEVELOPMENT ADMINISTRATION
1963

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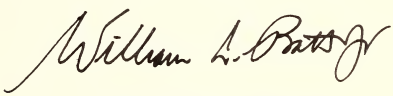
Foreword

The development of new products and processes is a prime factor in stimulating new business.

This fact is particularly significant to the redevelopment area which must revitalize its industrial base--or create a new one--if it is to restore itself to economic solvency.

With this in mind, the Area Redevelopment Administration, in cooperation with the Office of Technical Services, U.S. Department of Commerce, has prepared the following bibliography of technical reports available from Federal agencies. These reports cover recently developed products and processes that can serve to stimulate new product ideas for any firm, regardless of size or location.

This is another technical booklet in the *Area Redevelopment Bookshelf of Community Aids.*



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Area Redevelopment Administration

Contents

RECENT REPORTS ON NEW PRODUCTS AND PROCESSES

Among the many actions that a redevelopment area can take to revitalize its economy are to expand existing local industries or to create new industrial activity tailored to the specific resources of the area. Either action should be undertaken in conjunction with a thorough investigation of the possibilities for new or improved production within local plants.

The reports listed in this bibliography discuss new products and processes resulting from recent research and development activities. They can be used to suggest ways for a local plant to expand its operations and potential markets by manufacturing new products, by using newly conceived processes in the manufacture of its existing products, or by otherwise making money-saving technological improvements. To provide the most up-to-date assistance possible, the bibliography includes only those reports which have been published since January 1960.

How To Use The Bibliography

The bibliographical entries have been arranged for easy reference according to Standard Industrial Classification (SIC) codes.* To aid in locating available Government reports for a particular product class, an alphabetical index of the major industry groups covered in this bibliography has also been included.

At the end of each entry, preceding its annotation, a source reference is made to the Federal agency issuing the particular publication. A request for the report should be addressed to that agency, and should be accompanied by a check or money order for the cost of the publication, as noted.

Some General References

The following general references include a few materials that can give the reader background insights into the broad subject of new product development and periodicals that can help the ambitious community redevelopment group or business firm keep abreast of current developments in new products and improved technology.

Developing & Selling New Products: A Guidebook for Manufacturers, 2d. edition. U.S. Department of Commerce and Small Business Administration, 1955. Available at 45¢ a copy from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

Inventions Wanted by the Armed Forces and Other Government Agencies. U.S. Department of Commerce, Office of Technical Services, National Inventors Council, Washington 25, D.C. Free.

Marketing Information Guide (Vol. X, Supplement 1, March 1963), "Annual Listing of Federal Government Periodicals." U.S. Department of Commerce, Business and Defense Services Administration, Office of Marketing Services. Available, at 20¢ per copy, from Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

Publications for Use in Marketing and Distribution, December 1961. U.S. Department of Commerce, Business and Defense Services Administration, Office of Marketing Services. Available, at 20¢ per copy, from Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

Products Lists Circular (issued monthly). Small Business Administration, Office of Procurement and Technical Assistance, Washington 25, D.C. Free.

Technical Reports Newsletter (issued monthly). U.S. Department of Commerce, Office of Technical Services. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.—Subscriptions: $1.00 a year; single copies, 10¢ each.

Small Business Bulletin No. 4. Bibliography: New Product Development and Sale, Small Business Administration, Washington 25, D.C. Free.

*Standard Industrial Classification codes refer to the breakdown of industries into major categories or industry groups (as represented by 2-digit code numbers) and into several levels of subcategories (as represented by 3- and 4-digit codes). These classifications, revised in 1957, were defined by the U.S. Bureau of the Budget to provide a basis for the uniform reporting of industry data collected and disseminated by Federal agencies.

NEW PRODUCT REPORTS FOR SOME MAJOR INDUSTRY GROUPS

SIC-01. COMMERCIAL FARMS

0119 Bamboo in the U.S.: Description, Culture, and Utilization. R. A. Young and J. R. Haun. June 1961. U.S. Dept. of Agriculture, Agricultural Research Service, Crops Research Division, Beltsville, Md.

0119 Rice As a Crop For Salt-Affected Soil in Process of Reclamation. G.A. Pearson and R. H. Nieman. Produc. Res. Rept. No. 43, 13pp. 1960 No. 292. U.S. Dept. of Agriculture, Agricultural Research Service, Soil and Water Conservation Research Division, U.S. Salinity Laboratory, P. O. Box 672, Riverside, Calif.

0122 Notice to Fruit Growers and Nursery Men Relative to the Naming and Release of the Redtop Peach. U.S. Dept. of Agriculture, Agricultural Research Service, U.S. Horticultural Field Station, 2121 South Peach Ave., Fresno, Calif., 1961.

A new peach variety called Redtop is released for propagation. It is a high quality, freestone peach which is larger than the Coronet variety, but usually not as large as Redglobe. The trees of Redtop are moderately vigorous and productive. The variety has been shipped in part-carload lots from several orchards in California and had good fresh fruit market acceptance. Because of its unusually firm flesh, it should be useful for long-distance shipping. Redtop is introduced because of its firmness, attractiveness, flavor and ripening period.

0122 Bruising of Red Cherries in Relation to the Method of Harvest. R. T. Whittenberger, and C. H. Hills. USDA, ARS 73-27, 14pp. 1538, August 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Eastern Utilization Research and Development Division, 600 East Mermaid Lane, Philadelphia 18, Pa.

Red cherries were harvested experimentally by two new methods designed to reduce bruising. Overall results indicated that major improvements in the harvesting of cherries can be made without lowering quality.

0139 Usable Forage Under Pine Stands. J. H. Ehrenreigh. Sta. Note 142, 2pp. illus. (20) U.S. Dept. of Agriculture, Forest Service, Central States Forest Experimental Station, 111 Old Federal Building, Columbus, Ohio.

Total herbage yield increased more than 14 times as basal area of pine was decreased from 130 square feet to 50 square feet basal. There is enough forage in these low density pine stands to make grazing worthwhile.

SIC-08. FORESTRY

0822 Forestation of Strip-Mined Land in the Central States. G. A. Limstrom. Agric. Handb. No. 166, illus. (34) U.S. Dept. of Agriculture, Forest Service, Central States Forest Experimental Station, 111 Old Federal Building, Columbus, Ohio.

Tells where, when, and how tree planting should be done on strip-mined land and discusses site conditions that affect such planting.

0822 Planting Sitka Spruce and Douglas-Fir on Decayed Wood in Coastal Oregon. C. M. Berntsen, Research Note 197, 5pp. Nov. 1960. U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

0822 The Relationship of Diameter to Height of Attack in Lodgepole Pine Infested by Mountain Pine Beetle. Research Note 78, 4 pp. illus. D. B. Cahill 1960. U.S. Dept. of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, Ogden, Utah.

0823 Bushel Baskets Make Low Cost Seed and Litter Traps. R. E. Phares, and N. F. Rogers, Journal of Forestry 55 (5):398-399, illus. (46) U.S. Dept. of Agriculture, Forest Service, Central States Forest Experimental Station, 111 Old Federal Building, Columbus, Ohio.

Describes how bushel baskets can be made into traps for collecting forest tree seed and litter.

0823 Some Factors Affecting Oak and Black Walnut Reproduction. J. E. Krajicek. Ia. State Jour. Sci. 34(4):631-634. (31) U.S. Dept. of Agriculture, Forest Service, Central States Forest Experimental Station, 111 Old Federal Building, Columbus, Ohio.

Litter was found to be more detrimental than rodents to reproduction of four oak species whereas for black walnut the opposite was true. For all species few

seedlings were produced unless the seeds were in the soil.

0851 Local Benefits From Timber Industry Expansion. D. P. Worley. Tech. Paper 172, 17pp. (54) U.S. Dept. of Agriculture, Forest Service, Central States Forest Experimental Station, 111 Old Federal Building, Columbus, Ohio.

Every additional step in wood-products manufacture adds to the value of the product and hence to the profit that can be derived from it.

0851 Proceedings of the Conference on "Forest Industry Opportunities in Rural Development," Harrisburg, Pa. Nov.-21-22, 1960. Reprinted from Northeastern Logger Vol. 9, Nos. 8-9. U.S. Dept. of Agriculture, Forest Service, Northeastern Forest Experiment Station, 102 Motors Ave., Upper Darby, Pa.

SIC-09. FISHERIES

0919 Commercial Possibilities and Limitations in Frog Raising. FL 436 leaflet, U.S. Dept. of the Interior, Fish and Wildlife Service, Washington 25, D.C.

0919 Fish Baits: Their Collection, Care, Preparation and Propagation FL 28 leaflet U.S. Dept. of the Interior, Fish and Wildlife Service, Washington 25, D.C.

0919 Utilization of Fishery Byproducts of Washington and Oregon. FL 370 leaflet U.S. Dept. of the Interior, Fish and Wildlife Service, Washington 25, D.C.

SIC-12. BITUMINOUS COAL AND LIGNITE MINING

1212 Design and Preliminary Operation of a Slagging Fixed-Bed Pressure Gasification Pilot Plant. W. H. Oppelt, and G. H. Gronhovd. Reprint No. 61F18, AIME U.S. Dept. of the Interior, Bureau of Mines—Region III, Grand Forks Lignite Research Laboratory, P.O. Box LL, University Station, Grand Forks, North Dakota.

An important approach to use of lignite is through gasification that produces gas for the manufacture of synthetic chemicals and fuels. The design of a fixed-bed pressure gasification pilot plant to be operated under slagging conditions is described.

1214 Development and Operation of a Pilot Plant For Feeding Bituminous Coal Slurry to a Pressure Gasifier. W. R. Huff, and L. F. Willmott. Bur. Mines Rept. of Invest. 5719, 1961, 36 pp. U.S. Dept. of the Interior, Bureau of Mines--Region V, Morgantown Research Center, P.O. Box 880, Collins Ferry Road, Morgantown, West Virginia.

1214 Underground Gasification of Coal: Operation of Multi-Path System. J. P. Capp, R. W. Lowe and E. F. House, Bur. Mines Rept. of Invest. 5830, 13pp. 1961. U.S. Dept. of the Interior, Bureau of Mines—Region V, Morgantown Research Center, P.O. Box 880, Collins Ferry Road, Morgantown, West Virginia.

1214 Underground Gasification of Coal: Hydraulic Fracturing as Method of Preparing a Coalbed. J. P. Capp, J. L. Elder, D. D. Pears, R. W. Lowe, K. D. Plants, and M. H. Fies. Bureau Mines Rept. of Invest. 5666, 50pp. 1960. U.S. Dept. of the Interior, Bureau of Mines—Region V, Morgantown Research Center, P.O. Box 880, Collins Ferry Road, Morgantown, West Virginia.

1214 Carbonizing Properties of Wyoming Coal. W. S. Landers, V. F. Parry, M. Gomez, E. O. Wagener, J. B. Goodman, and C. R. Nelson, Rept. of Invest. 5731, 74pp. 1961. U.S. Dept. of the Interior, Bureau of Mines—Region III, Denver Coal Research Laboratory, Building 20, Federal Center, Denver 25, Colorado.

SIC-15. BUILDING CONSTRUCTION—GENERAL CONTRACTORS

1511 Specifications and Costs of a Standardized Series of Fallout Shelters. W. E. Strope, L. G. Porteous, and A. L. Grieg. Naval Radiological Defense Lab., San Francisco, October 1959, 153pp. (Order PB 161973 from OTS, price $3.00). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Basic performance specifications are developed to govern the design of personnel shelters to provide protection against radioactive fallout. Consideration is also given to protection against blast, heat, and fires. Design specification and cost estimates are prepared for a shelter based on a 25 ft. by 48 ft. ammunition storage magazine. Provision is made for 14-day occupancy by 100 people. The cost differential of various choices of performance characteristics are estimated. The design is in sufficient detail to permit construction. Shelters of this type may have wide application in residential areas, industrial areas, and military installations.

SIC-20. FOOD AND KINDRED PRODUCTS

2013 Improving the Quality of Frozen-Dried Steaks Through Application of Proteolytic Enzymes, C. E. Weir, October 1958, 27pp. American Meat Institute Foundation. (Order PB 145 762, mi $2.70, ph $4.80) Photodupli-

cation Service, Library of Congress, Washington 25, D.C.

A description and discussion are made of the effects of twelve proteolytic enzymes upon muscle fiber and connective tissue structure and panel evaluations for tenderness and amount of residue in frozen-dried raw beef.

2023 Dehydration of Lacteal Fluids. Patent No. 2,934,441, April 26, 1960. 25 cents. A. I. Morgan, Jr., and J. M. Randall. U.S. Dept. of Commerce, Patent Office, Washington, D.C.

Concerns dehydration of milk by foam-mat process. Milk is concentrated, formed into a foam by incorporation of air and a foam-stabilizing agent and resulting foam is dehydrated in a draft of hot air.

2031 Construction and Operation of an Inexpensive Fish Smokehouse. M. E. Waters and D. J. Bond, Commercial Fisheries Review, vol. 22, No. 8, August 1960, p. 8-12 (Separate No. 597) U.S. Dept. of the Interior, Fish and Wildlife Service, Branch of Reports, Bureau of Commercial Fisheries, Washington, D.C.

2031 Fish Flour For Human Consumption. J. H. Olden. Commercial Fisheries Review, vol. 22, No. 1, Jan. 1960, p. 12-18. (Technical leaflet No. 17) (Separate No. 575) U.S. Dept. of the Interior, Fish and Wildlife Service, Branch of Reports, Bureau of Commercial Fisheries, Washington, D.C.

2033 The Preservation of Pulp and Fortification of Late Season Poorly Colored Red Grapefruit Juice. B. J. Lime, and F. P. Griffiths, J. Rio Grande Valley Hort. Soc. 14, 88-93, 1960. 2000 U.S. Dept. of Agriculture, Agricultural Research Service, Southern Utilization Research and Development Division, Southern Regional Research Lab., 1100 Robert E. Lee Boulevard, New Orleans 19, Louisiana.

A highly colored red grapefruit pulp, free from seeds and rag, was recovered early in the season from waste products of juice plant finishing operations by use of a brush finisher. Pulp was kept for three months in frozen storage or at room temperature after pasteurization without adverse effects on quality. Excess pulp, from the processing of red grapefruit juice was recovered, stored, and successfully used to improve the color of canned single strength colored grapefruit juice under normal processing plant conditions, which indicates the commercial applicability of the process.

2034 Studies on English (Persian) Walnuts, Juglans Ryegia. II. Dehydration of Kernels with the Belt-Trough Dryer. Louis B. Rockland, Edison Lowe, D. M. Swarthout, and R. A. Johnson (U.S. Fruit and Vegetable Chemistry Laboratory, Pasadena, Calif.) Food Technol. 14(12): 615-618, December 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Western Utilization Research and Development Division, Western Regional Research Laboratory, 880 Buchanan Street, Albany 10, Calif.

High-moisture walnut kernels were dehydrated to their optimum moisture range on the belt-trough dryer at temperatures ranging from 160 degrees F. to 225F. during drying for periods from one-half to one and one-half hours. Optimum dehydration conditions appear to be accomplished by two-stage drying for about equal periods at 180F. and 210F., respectively. Under these conditions drying was accomplished within one hour. Appearance of kernels was improved, apparently by removal of chaff and fines in the updraft of warm air.

2034 Production of Dehydrated Potatoes, Patent No. 2,959,487, November 8, 1960. 25 cents. G. K. Notter and C. E. Hendel. U. S. Dept. of Commerce, Patent Office, Washington, D.C.

Method for preparing potato granules by a process involving cooking, mashing, partial dehydration, freezing, granulation by extrusion of the frozen material and final drying.

2034 Continuous Process of Dehydrated Fruit and Vegetable Juices, Patent No. 2,955,046, Oct. 4, 1960. 25 cents, A. I. Morgan, Jr., and L. F. Ginnette. U.S. Dept. of Commerce, Patent Office, Washington, D.C.

Liquid food products, such as fruit juices, are continuously dehydrated by a process which involves forming the food into a stable foam and dehydrating the foam by contact with hot air under atmospheric pressure. The dry products are obtained in a porous condition and exhibit very rapid dehydration characteristics.

2034 Dehydration of Fruit and Vegetable Juices, Patent No. 2,955,943, Oct. 11, 1960. 25 cents, A. I. Morgan, Jr., and L. F. Ginnette. U.S. Dept. of Commerce, Patent Office, Washington, D.C.

A juice concentrate is foamed by incorporation of air and a colloidal foam-stabilizer, such as egg albumin. The foam is then contacted with hot air atmospheric pressure to yield a dehydrated product in porous, easily dehydratable form.

2036 Recommended Practices for Processing Chilled and Frozen Whiting. Richard D. Tenney and Mario N. Sereno. Technical note No. 55, Commercial Fisheries Re-

view, vol. 22, No. 5, May 1960, pp. 6-9. Gloucester Technical Lab. No. B 65. U.S. Dept. of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Technological Laboratory, Emerson Avenue, Gloucester, Mass.

2036 Application of a Steaming and Vaccum Method to the Shucking of Calico Scallops, H. R. Bullis, Jr., and T. D. Love, Commercial Fisheries Review, May 1961.(USDI Separate 618). U.S. Dept. of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Pascagoula Fishery Station, P.O. Box 630, Pascagoula, Mississippi.

2036 Inhibition of Mold in Smoked Mullet. Melvin E. Waters, Commercial Fisheries Review 23, No. 4 (1961) p.8. U.S. Dept. of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Pascagoula Fishery Station, P.O. Box 630, Pascagoula, Miss.

2037 Edible Pod Peas Offer New Opportunities for Frozen Vegetable Sales Growth. H. J. Neumann, A. D. Shepherd, and D. W. Venstrom. Quick Frozen Foods 22(7): 43-44, 154, Feb. 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Western Utilization Research and Development Division, Western Regional Research Laboratory, 800 Buchanan Street, Albany 10, Calif.

Frozen edible pod peas were held at 0 degrees F. for 2, 4, 8, and 12 months, and compared with -20F. control samples. Flavor and texture changes were small. Crisp texture was retained through processing and storage. One third of the initial ascorbic acid content was lost after 12 months at 0 degrees F. Color appeared to be the dominant factor in storage stability.

2037 Citrus Pectinesterase Inhibitor in Grape Leaf Extract. T. J. Kew, and M. K. Veldhuis, Proc. Florida State Hort. Soc., 73, 293-97, 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Southern Utilization Research and Development Division, U.S. Fruit and Vegetable Products Laboratory, 600 Avenue S., N.W., Winter Haven, Florida.

Water extracts were made from the leaves of four cultivated varieties of muscadine grapes and of wild grapes. These extracts reduced pectinesterase activity and improved the cloud stability of orange juices.

2042 Fishery Resources For Animal Food. FL 501 leaflet U.S. Dept. of the Interior, Fish and Wildlife Service, Washington 25, D.C.

2042 Salmon Cannery Waste For Mink Food. FL 405 leaflet U.S. Dept. of the Interior, Fish and Wildlife Service, Washington 25, D.C.

2043 Process of Canning Wheat, Patent No. 2,929,725, March 22, 1960, 25 cents, M. J. Copley, D. K. Mecham, N. E. Weinstein, and R. E. Ferrel. U.S. Dept. of Commerce, Patent Office, Washington, D.C.

A new, easy-to-serve food is prepared from wheat. To this end, unbroken wheat grains are partially de-branned, soaked in water until their moisture content in about 40-60 percent, and then canned with application of heat to sterilize the product. The canned wheat may be prepared for the table by heating in water for a few minutes.

2043 New Flavor Found in Bulgur, An Ancient Wheat Food. W. L. Haley and J. W. Pence, Cereal Sci. Today 5(7): 202-204, 206-207, 214, Sept. 1960. (Report was prepared in co-operation with Fisher Flouring Mills, Seattle, Wash.) (1288) U.S. Dept. of Agriculture, Agricultural Research Service, Western Utilization Research and Development Division, Western Regional Research Laboratory, 800 Buchanan Street, Albany 10, Calif.

The versatility of bulgur in cookery, along with improved processing, promotional effort, and wider commercial distribution, has increased its use in recent years.

2046 Pilot Plant Studies on the Continuous Batter Process to Recover Gluten From Wheat Flour. R. A. Anderson, V. F. Pfeifer, E. B. Lancaster, C. Vojnovich, and E. L. Griffin, Jr. Cereal Chem. 37(2):180-188 March 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Northern Utilization Research and Development Division, 1815 North University, Peoria, Illinois.

2046 Vital Wheat Gluten by Drum Drying. II. Pilot-Plant Studies and Cost Estimates. C. Vojnovich, V. F. Pfeifer, R. A. Anderson, and E. L. Griffin, Jr. Cereal Chem. 37(4): 422-435. July 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Northern Utilization Research and Development Division, 1815 North University, Peoria, Illinois.

Conditions and equipment suitable for the production of vital wheat gluten by drum-drying wet gluten dispersed in dilute acetic acid were studied. The process uses standard equipment and it can be readily adapted in industrial plants to make dry vital gluten for baking or other food purposes, or for the preparation of industrial chemicals. Cost estimates are given.

2051 Marketing Frozen Bread--A Preliminary Report. R. V. Enochian, U.S. Agr. Market Serv. Rpt. AMS-395, 16pp., illus., processed Aug. 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Western

Utilization Research and Development Division, Western Regional Research Laboratory, 800 Buchanan Street, Albany 10, Calif.

Report of a study conducted by Agricultural Marketing Service in cooperation with Agricultural Research Service. Data from secondary sources indicate that distribution of bread as a frozen food would result in a lowering of marketing costs. Other factors that might affect distribution of frozen bread are discussed.

2051 Effect of Freezing, Defrosting, and Storage Conditions of the Freshness of Dinner Rolls and Cinnamon Rolls. K. Kulp and W. G. Bechtel. Cereal Chem. 37(2): 170-179, March 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Western Utilization Research and Development Division, Western Regional Research Laboratory, 800 Buchanan Street, Albany 10, Calif.

A report on the effect of different conditions of freezing, frozen storage, and defrosting on freshness and firmness of soft dinner rolls and a typical sweet yeast-raised product, cinnamon rolls.

2099 Potato Flakes. V. Potato Flakes of Increased Density. R. K. Eskey. F. H. Drazga, J. Cording, Jr., J. F. Sullivan, C. F. Woodward, USDA, ARS 73-30, 20 pp. September 1960. 1475 U.S. Dept. of Agriculture, Agricultural Research Service, Eastern Utilization Research and Development Division, 600 East Mermaid Lane, Philadelphia 18, Pa.

A process is described whereby a dehydrated mashed potato product of high bulk density can be prepared from potato flakes by mechanically manipulating the hydrated flakes at or below the moisture range at which granulation occurs.

2099 Direct Process for Producing Potato Granules, CA-74-6, April 1960. (mimeographed) U.S. Dept. of Agriculture, Agricultural Research Service, Western Utilization Research and Development Division, Western Regional Research Laboratory, 800 Buchanan Street, Albany 10, Calif.

A correspondence aid giving latest developments in progress on the production of potato granules.

SIC-22. TEXTILE MILL PRODUCTS

2261 New Silicone Alloy For Durable Water Repellency on Cotton. 1923. C. J. Conner, W. A. Reeves, L. H. Chance. Textile Research J., 30, 171-178, 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Southern Utilization Research and Development Division, Southern Regional Research Lab., 1100 Robert E. Lee Boulevard, New Orleans 19, La.

A new silicone alloy is an excellent water repellent for cotton fabrics as measured by the AATCC spray ratings. The treatment is very resistant to soap and detergent action. The alloy may be applied from organic solvents or aqueous emulsions. Greater permanence to laundering was obtained by the solvent method.

2261 "Quarpel" Water- and Oil-Resistant Treatment for Textiles. Textile Series Report No. 111. C. DeMarco and others, Quartermaster Research & Engineering Command, for Dept. of the Army. April 1960. 25 pp. (Order PB 171 838, price 75 cents) U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A new water- and oil-repellent treatment for Army clothing promises to keep soldiers dryer longer, yet maintains its moisture-proof properties throughout repeated washings, according to a research study conducted by the Army. The treatment is called "Quarpel." Its effectiveness, for the first time, presents performance standards of a truly durable water resistant finish, according to an Army spokesman.

SIC-24. LUMBER AND WOOD PRODUCTS, EXCEPT FURNITURE

2421 Forced Air-Drying of Southern Pine Lumber. L. I. Gaby, Station Paper No. 121. May 1961. U.S. Dept. of Agriculture, Forest Service, Southeastern Forest Experiment Station, Post Office Bldg., Asheville, N.C.

Rough, green, southern pine lumber can be rapidly dried by using forced air circulation without significant degrade when drying conditions are controlled. When the cost benefit factors of forced air-drying lumber are studied thoroughly, it will be seen that this method has many advantages over conventional yard air-drying.

2421 Saw Performance and Lumber Characteristics When Producing Pulpable Southern Pine Sawdust. F. B. Malcolm, L. H. Reineke, and H. Hallock. FPL Rept. No. 2210, 52pp., Feb. 1961. U.S. Dept. of Agriculture, Forest Service, Forest Products Laboratory, Madison 5, Wis.

Saw performance and lumber characteristics limit maximum chip length to 1/4 inch. Economic evaluation indicated more potential profit could be derived from increasing the accuracy of conventional methods at a maximum 1/8 inch feed per tooth compared to kerf chip sawing at 1/4 inch feed per tooth.

2421 Improved Harvesting Methods, Equipment Survey Notes: Log Dimensions and the Selection of Equipment. A. Chardin, C. Lep-

etre, and L. LeRay with introduction by E. W. Fobes. FPL Rept. No. 1637-59, 30 pp., March 1961. U.S. Dept. of Agriculture, Forest Service, Forest Products Laboratory, Madison 5, Wis.

Equipment capable of transporting and sawing the largest logs is not the most economical or convenient. Bucking large diameter logs into shorter lengths and use of supplementary sawing aids may avoid the need for larger units of equipment to handle a few logs. Analysis of log size frequencies aids slection.

2421 Upgrading the Product of Hardwood Lumber Operations. I. Logging Hardwoods More Intelligently. F. C. Simmons. South. Lumberman 200 (2498): 33, 34, 36, 40, illus. 1960. U.S. Dept. of Agriculture, Forest Service, Northeastern Forest Experiment Station, 102 Motors Ave., Upper Darby, Pa.,

2421 Upgrading the Product of Hardwood Lumber Operation, II. Hardwood Sawmilling Practices That Pay. F. C. Simmons, South. Lumberman 200 (2499): 31-34, 36, 48, illus. 1960. U.S. Dept. of Agriculture, Forest Service, Northeastern Forest Experiment Station, 102 Motors Ave., Upper Darby, Pa.,

2421 It Pays to Roof Your Lumber. W. P. Clark, and T. M. Headlee. South. Lumberman 200(2492): 39-40, 44, illus. (15) U.S. Dept. of Agriculture, Forest Service, Central States Forest Experimental Station, 111 Old Federal Building, Columbus, Ohio.

Shows savings that were realized from using roofs on piles of red oak and yellow-poplar lumber during air-drying.

2421 Lumber Grade Recovery From Old-Growth Douglas-Fir at a Northwestern Oregon Sawmill. E. H. Clarke, Research Note 191, 12pp., Oct. 1960. U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

2421 Effect of Solid Storage on the Uniformity of Final Moisture Content of Kiln Dried Lumber. Harvey H. Smith, and John R. Dittman. Pacific. Southwest Forest and Range Expt. Station Res. Nost 162. 5pp., illus. U.S. Dept. of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station, 1960 Addison Street, Post Office Box 245, Berkeley 1, Calif.

One week of bulk or solid storage of kiln dried lumber had a pronounced effect on moisture distribution within individual pieces. Areas of high moisture were greatly reduced.

2426 New Antishrink Treatment Improves Wood For Gunstocks, Other Uses. H. L. Mitchell. Wood and Wood Products. 65(11): 50, 52, 102. Nov. 1960. U.S. Dept. of Agriculture, Forest Service, Forest Products Laboratory, Madison 5, Wis.

2433 Column Design in Continuous Structures. M. Ojalvo and V. Levi. Fritz Engineering Lab., Lehigh University. June 1961. 41pp. (Order AD-261 474, price $4.60) U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A new method for the design of columns in multi-story continuous frames is developed. The method applies to planer frames adequately braced against sway. The method is illustrated by the design of an interior column. Charts necessary in the application of the method are appended.

2491 Third Report on Preservative Treatment of Wood For Combat Vehicles. J. P. Hill and R. M. Nichols, Aberdeen Proving Ground, Department of the Army. December 1960. 24pp. (Order PB 171 330, price 75 cents) U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Controlled retention and maximum penetration cycles in the preservation treatment of wood substantially improved its outdoor durability in tests conducted by the Army.

2499 General Recommendations Regarding Methods for Wood Waste Utilization Inf. Rev. & Reaf. 1960. 1666 U.S. Dept. of Agriculture, Forest Service, Forest Products Laboratory, Madison 5, Wisconsin.

2499 Board Materials From Wood Residues. Wayne C. Lewis, Forest Products Laboratory Rept. No. 1666-21, 6pp., revised May 1961. U.S. Dept. of Agriculture, Forest Service, Forest Products Laboratory, Madison 5, Wisconsin.

SIC-25. FURNITURE AND FIXTURES

2511 Beech For Furniture. P. H. Graham, Beech Util. Series 20; 16pp. illus. 1960. U.S. Dept. of Agriculture, Forest Service, Northeastern Forest Experiment Station, 102 Motors Ave., Upper Darby, Pa.

2531 Light-Weight Seating: Design Research on a Nylon Net Seat. One of a Series of Studies Pertaining to Crew Compartment Habitability for Extended Missions. J. Forrest and others, Bio-Mechanics Laboratory, Tufts University, for Wright Air Development Center, USAF. December 1958. 39pp. (Order PB 151 702, price $1). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

As part of a series of studies on lightweight aircraft seating sponsored by the Air Force, a design research program was

developed for a lightweight aircraft seat made of nylon netting. This seat offers a more flexible and comfortable seat than usually available, since rigid seats do not always accommodate individual body types.

SIC-26. PAPER AND ALLIED PRODUCTS

2621 Rice Straw For Bleached Papers. A. J. Ernst, Y. Fouad, and T. F. Clark. TAPPI. 43(1): 49-53. January 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Northern Utilization Research and Development Division, 1815 North University, Peoria, Illinois.

Rice straws from Arkansas, Louisiana, and Egypt were studied as raw materials from which to make fine bleached papers by mechano-chemical and pressure-pulping techniques. Pulping was done with both caustic soda and kraft chemicals. An effective washing treatment was developed to remove friable leaf material and debris from the straws before pulping. No unusual equipment or techniques are required to prepare quality pulps from rice straws. Selected rice straw pulps were converted either alone or in blends with wood pulps to a variety of papers on a laboratory Fourdrinier machine.

2641 New Product: Paper Size From Pine Gum. N. B. Knoepfler, and R. V. Lawrence, Naval Stores Review lntern. Ybk. 1960, 14, 62. U.S. Dept. of Agriculture, Agricultural Research Service, Southern Utilization Research and Development Division, Southern Research Lab., 1100 Robert E. Lee Boulevard, New Orleans 19, La. (2026)

The research activities of the Naval Stores Station during the past year are reviewed. The development of a new method of making paper size directly from pine gum is summarized.

2646 Pulps and Corrugating Paperboards from Farm-Woodland Chestnut Oak. R1738. J. N. McGovern, M. Heining, E. L. Keller, and J. S. Martin. Research & Marketing Act Studies No. 16, March 1956. Revised 1960. U.S. Dept. of Agriculture, Forest Service, Forest Products Laboratory, Madison 5, Wis.

2654 Determination of Protection Afforded by Perishable Products Shipping Containers. Arctic Aeromedical Laboratory, USAF. June 1959. 12pp. (Order PB 161 975, price 50 cents). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A double weight, 3-in-1 cardboard carton assembly tested by the Air Force in the sub-arctic protects fresh produce from significant freezing for periods up to an hour in ambient temperatures of -40 degrees F. The experiment was conducted as part of an Air Force study to determine the amount of protection afforded fresh fruits and vegetables by cardboard shipping containers in sub-zero temperatures.

2661 Utilization of Farm Woodlot Woods for Roofing Felt. E. A. Anderson and C. E. Hrubesky. FPL Report No. 1739 Inf. Rev. & Reaf. 1960. U.S. Dept. of Agriculture, Forest Service, Forest Products Laboratory, Madison 5, Wis.

SIC-28. CHEMICALS AND ALLIED PRODUCTS

2818 Wood, A Source of Raw Material For Chemical Utilization. E. G. Locke, Forest Products Lab. June 1961. 6pp. (Order AD-262 248, price $1.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

More than 80 million tons of low-value wood could be made available annually as raw material for conversion to organic chemicals. This material would be available primarily as processing and harvesting residues. Data are given for quantities and types of residues available by region in the U.S.

2818 Rain Repellent. R. Blaufox, E. McDonnell, and J. Mitchell Fain. Snell, Foster D., Inc. July 1961, 29pp. (Order AD-260 581, price $2.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A formulation based on acidified dimethyldiethoxysilane dissolved in n-hexyl ether and combined with silicone oil has good rain-repellent properties and an increased flash point.

2819 Volatilization of Tin Chloride from Bolivian Slimes. RI 5449. K. K. Kershner and A. A. Cochran. 1959. 12pp. 7 figs. U.S. Dept. of the Interior, Bureau of Mines, Publications Distribution Section, Washington 25, D.C.

Describes the method developed by Bureau of Mines by which much of the tin from waste material at Bolivian concentrators can be recovered as a chloride by volatilization with hydrogen and hydrogen chloride in a rotary kiln.

2821 Epoxidized Novolac Resins as Structural Adhesives. W. C. Tanner, and Raymond F. Wegman. Technical Rept. FRL-TR-20, Dec. 1960. 18pp. Dept. of the Army, Picatinny Arsenal, Dover, New Jersey.

Epoxidized Novolac resins are described which are useful for formulating structural adhesive systems. The tensile and impact strengths of room-temperature-cured adhesive bonds developed to steel by both

bisphenol-A and epoxidized Novolac adhesives are presented.

2821 High Temperature-Resistant Transparent Plastics. Quarterly Progress Rept. H. Christie and T. Medved. Midwest Research Institute. May 1961. 20pp. (Order AD 261 098, price $2.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

According to this study an increase in the thermal resistance of transparent plastics can be obtained. In addition, a process of curing improves the color of the castings.

2821 Polymeric Compounds to Improve the Fastening Strength of Wood with Wood Fasteners. J. M. Richolson, Material Lab., New York Naval Shipyard. August 1960, 18pp. (Order AD-259 053, price $1.60) U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Three polymeric compounds were evaluated and compared with beeswax as a coating for steel screws used as fasteners for wood joints: (1) a moderately viscous polyester; (2) a moderately viscous epoxy; and (3) a free flowing epoxy. The results indicated that the polymers increased the holding power of the screws in four kinds of wood (cypress, Douglas fir, teak and white oak) from about 10 to 50%. The increase in holding power in plywood and particle-bound board was about 20 to 40% respectively. The corrosivity of the four woods was decreased about 65 to 95% when epoxy polymers were used. A significant decrease in driving resistance was obtained by the use of epoxy-based polymeric compounds.

2821 Transparent Packaging, S. Stambler, C. Katz, S. Gordon, Naval Supply Research Development Facility, Bayonne, N. J., May 1960. 78pp. (Order OTS $2.00, PB 154198) U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

This report presents the results of a study to evaluate transparent films for packaging applications. It was determined that no one film could be used as an all-purpose military barrier material. Four mil low density polyethylene and laminations of mylar and polyethylene may be used as additional military barrier material and provide the added property of transparency. Performance requirements based on the needs of the military supply system were developed for transparency films.

2822 Development of Ozone-Resistant Polymers with Low Hysteresis. R. C. Bruce and others, Burke Research Company, for Detroit Ordnance District, Department of the Army. Oct. 1960. 101pp. (Order PB 171 578, price $2.25) U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Automobile and truck tires with low rolling resistance and smaller power loss can be manufactured by using a vinylic filler in place of the conventional carbon black filler, according to this Army research report. It would also be feasible to use this method to make aircraft tires. This would overcome the problem of surface softening in landing and braking.

2824 Improvement of Thermal Stability of Textile Fibers. F. R. Elrich, I. Sand and others, Institute of Polymer Research, Polytechnic Institute of Brooklyn, N. Y., June 1959, 27pp. (Order PB 153 958, price $2.60) U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A considerable number of flameproofing, cross-linking, and coating agents were tried and screened, and their effect tested by a simple melting point type apparatus. The most satisfactory results were obtained by coating nylon fibers with a thin sheath of polyacrylonitrile. Among many coating methods, two were found superior and potentially capable of practical application.

2833 Cape Marigold: Is It a New Crop in the Making? Quentin Jones, and Ivan A. Wolff. (USDA Crops Research Division, Beltsville, Md.) Chemurgic Dig. 19(1): 4-5 January 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Northern Utilization Research and Development Division, 1815 North University, Peoria, Illinois.

Discovered in a search for useful new oilseeds, the seed oil of the cape marigold provides a new reactive fatty acid, named dimorphecolic acid. One species (Dimorphotheca aurantiaca) out of the 60 or so species of cape marigold, and closely related Osteospermum ornamental flower, has been under cultural evaluation for two seasons. Growth characteristics of the plant and potential industrial uses for the oil are briefly described.

2833 Process to Recover Morphine From Poppy Straw. O. L. Brekke, G. C. Mustakas, M. C. Raether, H. G. Maister, and C. T. Langford. North, Util. Res. Devlpmt. Div., ARS, USDA, Unnumbered Series, March 1960. 190pp. (Processed) U.S. Dept. of Agriculture, Agricultural Research Service, Northern Utilization Research and Development Division, 1815 North University, Peoria, Illinois.

This report summarizes pilot plant results on the recovery of morphine from poppy straw. It includes an evaluation of

the product, a description and analysis of a recommended commercial process, material balances related to design of a commercial-size poppy processing plant, and estimates of the capital investment for such a plant, as well as operating costs.

2851 An Isocyanate Primer Sealer For Masonry. J. R. Griffith and G. E. Rohl, Chemistry Division, U.S. Naval Research Laboratory, for Department of the Navy. January 1961. 19pp. (Order PB 171 107, price 50 cents) U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Paint on masonry has been shown to withstand the elements better when applied over costs of anew isocyanate primer-sealer base that was recently tested by chemists at the U.S. Naval Research Laboratory.

2851 A New Device For Studying the Blister Resistance of House Paints. F. L. Browne and D. F. Laughnan. Forest Products Journal 10(3): 141-145, March 1960. U.S. Dept. of Agriculture, Forest Service, Forest Products Laboratory, Madison 5, Wis.

2851 Preparation of Varnish and Varnish Type Vehicles Containing Tung Oil. P. H. Eaves, J. J. Spadaro, and E. L. Patton. Paint Varnish Production 50, No. 8, 27-30, 82-83, 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Southern Utilization Research and Development Division, Southern Regional Research Lab. 1100 Robert E. Lee Boulevard, New Orleans 19, La. 1979.

Data are presented to show that a 100% tung oil varnish formulation can be processed in large volume vessels at the temperatures required for producing non-checking varnish and for the long periods of cooking time inherent in the use of such large volume vessels without the danger of gelling.

2851 Tung Oil-Resin Varnish Vehicle--A Preliminary Cost Analysis. K. M. Decossas, P. H. Eaves, S. P. Kolton, E. R. Pollard, and E. L. Patton. Paint and Varnish Production 50, No. 8, 33-36, 83, 1960. 1980 U.S. Dept. of Agriculture, Agricultural Research Service, Southern Utilization Research and Development Division, Southern Regional Research Lab., 1100 Robert E. Boulevard, New Orleans 19, La.

Tung oil-resin varnish vehicle is produced from tung oil and rosin by a process, developed by the Southern Utilization Research and Development Division, which prevents gelation. Details of the process and hypothetical plants are described for producing the 50 percent solids product in 200, 500, 1000, and 1500 gallon batches. Investment costs, operating costs, general expenses, and a cost analysis are given.

2851 Reinforced Plastic Coatings for the Protection of Metal Surfaces. L. N. Schultz and M. E. Phelps, Materials Labs., Puget Sound Naval Shipyard, Bremerton, Wash., Jan. 1960, 27pp. (Order PB 152 862, mi. $2.70 ph $4.80) Photoduplication Service, Library of Congress, Washington 25, D.C.

Antispoiling paints applied over plastic coated steel panels have been exposed for three years in full and part-time salt water immersion. The effect of this exposure on several resins with various surface treatments is described.

2852 First Report On Alkaline-Organic Missile Component Paint Removers. A. Mankowich, Aberdeen Proving Ground, U.S. Army. June 1959. 25pp. (Order PB 161 859, price 75 cents). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Up to 75 percent greater efficiency in stripping paint from aluminum and magnesium component parts is possible by modifying standard commercial alkaline organic paint removers, according to this Army report. Other advantages of the modified paint remover are improved rinsability of the residual soapy film, and establishment of conditions necessary for the retention of anodic coatings on magnesium parts.

2852 Gel-Type, Vertical Adherence Paint Removers. A. Mankowich--July 1960, 13pp., Coating and Chemical Lab., Aberdeen Proving Ground, Md. (Order PB 149 420, mi $2.40, ph $3.30) Photoduplication Service, Library of Congress, Washington 25, D.C.

A heavy duty, single phase, alkaline organic solvent paint remover, formulated during the development of medium pH strippers suitable for use on missile component parts of aluminum can be converted into stable, vertical adherence strippers by gelling with metallic soaps. A method of preparing the gels has been devised. While such removers are transformed into two liquid layers at 155° F. and frozen solid at -40°F., they regain their original consistency and adhesiveness at room temperature. Low alkalinity compositions of this type, suitable for use on aluminum-base metals from the non-corrosivity standpoint, are unsuitable because of almost zero stripping efficiency.

2861 Pinonic Acid. A Promising Chemical Raw Material. G. W. Hedrick, and R. W. Lawrence, Ind. Eng. Chem. 52, 853-856, 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Southern Utilization Re-

search and Development Division, Southern Regional Research Lab., 100 Robert E. Lee Boulevard, New Orleans 19, La.

Pinonic acid, by virtue of its structure, is a reactive chemical and can be converted to a number of substances which have not been evaluated industrially. The use of this acid as a chemical raw material is suggested. It can be made from a replenishable hydrocarbon obtainable from American turpentine, at a price which should attract chemical consumers. A review of the chemistry of pinonic acid is discussed.

2873 A Trial of Direct Control of Pine Engraver Beetles on a Small Logging Unit. Willard L. Jackson, Pacific Southwest Forest and Range Expt. Sta. Misc. Paper 44. 77pp., illus. U.S. Dept. of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station, 1960 Addison Street, Post Office Box 245, Berkeley 1, California.

The insecticide Lindane in kerosene was applied to fresh logging slash heavily infested with pine engraver beetles. Although outbreaks followed logging in other similar sites, only one pole-sized tree was killed in the 39-acre logging unit treated. Cost data given.

2873 The Chemical Control of Mistletoes. H. R. Offord. Weed Soc. Amer. Proc. Denver, Colorado (Abs.). U.S. Dept. of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station, 1960 Addison Street, Post Office Box 245, Berkeley 1, Calif.

Reviews accomplishments in chemical control of mistletoes in U.S. and other countries. Suggests types of toxicants and methods of application that appear promising for control of dwarf mistletoes.

2891 Adhesives for the Future of the Wood Industry. R. F. Blomquist, Adhesives Age 4(6): 20-27, June 1961. U.S. Dept. of Agriculture, Forest Service Products Laboratory, Madison 5, Wis.

With declining timber size and quality, our large timbers, paneling materials will inevitably be in the form of glued products put together out of many small pieces of wood bonded with adhesives to form materials of size and quality needed for tomorrow's products.

2899 Development of High Temperature Radiant Gas Brazing Method for Honeycomb Panels. W. C. Troy, Solar Air Craft Co. May 1961. 277pp. (Order AD-260 060, price $15.50).

An effective low cost radiant gas method for brazing honeycomb sandwhich was developed using small radiant burners. Thermal control and configurational flexibility inherent in the new brazing method permits great simplification in high temperature tooling, thus leading to lower product costs.

2899 A Flux-Free Method for Joining Aluminum to Stainless Steel. L. Lemon, Hanford Atomic Products, for U.S. Atomic Energy Commission. March 1961. 11pp. (Order HW-68789, price 50 cents). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A flux-free method of soldering aluminum to stainless steel at low temperatures, providing a gas-light, durable bond has been developed as part of a research project sponsored by the Atomic Energy Commission.

SIC-29. PETROLEUM REFINING AND RELATED INDUSTRIES

2992 The Stabilization of Silicone Lubricating Liquids Above 200 Degrees Centigrade: Part I-Conventional Oxidation Inhibitors and Some High-Survace Solids. H. R. Baker and others. U.S. Naval Research Laboratory. June 1960. 33pp. (Order PB 161 314, price $1). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

The useful life of commercial silicone oils can be extended from three to five times through the use of oxidation inhibitors effective in other systems, according to a Navy study.

2992 Process Quality Control for Corrosion Preventive Oils and Compounds. R. E. Johnson, Oct. 1959, 24pp. Rock Island Arsenal Lab., Ill. (Order PB 144 735 mi $2.70 ph $4.80) . Photoduplication Service, Library of Congress, Washington 25, D.C.

A quality control program was initiated and maintained in an attempt to insure the quality of preservative materials utilized in the storage of Ordnance material. The results obtained indicate that such a program is feasible and will provide valuable information if the personnel concerned are conscientious in the maintenance of necessary records.

2992 High Temperature Instrument Oil. A. A. Schwartz, H. R. Broadley Jr. and R. S. Norman, December 1960. 144pp. (Order AD-258 180, price $10.10). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Studies were made on lubricity improvers and oxidation inhibitors for silicone fluids. Full scale performance tests in instrument bearings were run both in air and in argon atmosphere. Significant improvement over the silicone-base oil was obtained when the oil was compounded with a lubricity improver, especially in the slow speed gimbal

SIC-32. STONE, CLAY, AND GLASS PRODUCTS

3231 Research on Non-Oxide Glasses. W. A. Fraser, Chicago Midway Labs., University of Chicago, July 1959, 55pp. (Order PB 171 526, price $1.50). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

The work of preparing new glasses involved two types of operations which progressed somewhat independently of each other. One type of operation was required for preparing specific compounds suitable for combining into glasses. The second type was the melting of the mixtures of the compounds to form glasses.

3272 Coral and Coral Concrete. W. R. Lorman, Naval Civil Engineering Lab., Port Hueneme, Calif., April 1960, 57pp. (Order PB 149 232, mi $3.60, ph $9.30). Photoduplication Service, Library of Congress, Washington 25, D.C.

This manual describes and defines coral reefs, beaches, and elevated formation; presents salient features relative to prospecting for suitable coral deposits, extracting coralline limestone, processing, and stockpiling the aggregate, summarizes findings concerning such physical properties of coral aggregate as bulk density, specific gravity, and absorption; furnishes typical coral concrete mix proportion data together with anticipated strength values.

3295 Synthetic Mica Crystal Growth Program. J. G. Froemel, Edgar E. Warden and others. Synthetic Mica Co., March 1961. 75pp. (Order PB 155 155 mi $4.50 ph $12.30). Photoduplication Service, Library of Congress, Washington 25, D.C.

Methods are developed for growth of large (4" x 6") synthetic mica crystals on a commercial scale. Special furnacing techniques are being evaluated on an in-plant basis including progressive (step-melting), controlled cooling schedules, seeding methods and melt super-heating.

3295 Development of Textile Type Vitreous Silica Yarns. W. Wendall Drummond and Burns A. Cash. Bjorksten Research Labs., Inc., March 1960. 53pp. (Order PB 161 845, price $1.50). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Experiments were performed leading to development of methods for producing vitreous silica yarns from fused quartz cones or rods by means of electrical heating devices. Both induction and resistance furnaces were used, best performance in a protective atmosphere. Power capabilities of available equipment were insufficient to permit production of a large number of continuous filaments simultaneously, but operator with five filaments was achieved. A limited amount of data on physical properties of filaments and strands was obtained.

3295 Acid-Ferrous Sulfate Leaching of Low-Grade Manganese Carbonate and Oxide Ores, Cuyuna Range, Minnesota. H. Dolezal and H. C. Fuller. 1959. 27pp. 5 figs. Dept. of the Interior, Bureau of Mines, Publications Distribution Section, Washington 25, D.C.

As part of the Bureau of Mines program for developing an economical process for utilizing low-grade manganese ores from the Cuyuna Range with Acid-ferrous sulfate. This method was developed to eliminate reductive roasting of oxide ores and to reduce the form deposits where they occur together.

3295 Pilot Plant Production of Cultured Quartz. B. Wawyer Research Products, Inc. April 1961. (Order AD-257 486, price $7.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Over 800 lbs. of inspected electronic-grade 4 crystal bars were cultured from ore taken from 3 domestic quartzite deposits. This material was manufactured into CR23/U oscillators and BC 71 AH 3mo frequency standard oscillators. Test results are given.

SIC-33. PRIMARY METAL INDUSTRIES

3312 An Investigation On Development of As-Cast Grain Refiner For Cast Steel. G. K. Turnbull, G. W. Form, and J. F. Wallace. Case Institute of Technology, December 1960. (Order AD-258 793, price $6.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Various substances were added to molten low carbon steel in an attempt to develop methods by which the as-cast structure of steel could be grain refined. Generally, the additions caused an improvement in strength, however, a loss in ductility and notch toughness also occurred.

3313 An Electrolytic Method for Separating Nickel and Cobalt. M. J. Ferrante and M. O. Butler. 1959. 23pp., 10 figs. RI 5543 U.S. Dept. of the Interior, Bureau of Mines, Publications Distribution Section, Washington 25, D.C.

Describes investigation of optimum conditions for deposition of Specification-grade nickel from nickel sulfate-boric acid solutions; covers leaching tests conducted with the same solutions to determine optimum conditions for preferential extrac-

tion of nickel from Nicaro basic carbonates.

3313 Air-Cooled Crucibles For Cold-Mold ARC Melting. M. M. Kirk, P. D. Magnusson and G. L. Schmidt. 1959. 23pp. 15 figs. U.S. Dept. of The Interior, Bureau of Mines, Publications Distribution Section, Washington 25, D.C.

Explosion risks in plants melting zirconium and similar reactive metals can be reduced by using air-cooled molds to catch the molten metal, according to this publication which describes how the air-cooled molds were designed, fabricated and tested.

3313 An Investigation of Electropolishing As a Technique for Producing Tapered Wire, by D. B. Darden, March 1960, 17pp. Southern Research Institute. (Order PB 149 848 mi $2.40, ph $3.30). Photoduplication Service, Library of Congress, Washington 25, D.C.

Previous tests on carbon steel music wire had shown no deterioration of tensile strength after electropolishing. Further investigation has shown that the electropolished wire has fatigue strength slightly superior to the unpolished wire. Metallurgical examination of polished and unpolished wires showed some structural differences but these could not be definitely attributed to electropolishing. Photographs of specimens are included. A schematic for the production facility for tapered wire is shown. The cost of producing the first 40,000 ft. tapered wire is estimated at about $5000. Production wires could possibly be produced for as little as $100 plus the cost of material.

3316 Toughness of Steel Sheet: The Advantage of Laminating. S. Arnold Watertown Arsenal Laboratories, Army Ordnance Corps. October 1960. 25pp. (Order PB 171 044, price 75 cents). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Laminating—the practice of using two or more thinner sheets in place of a single sheet of the same thickness—can be employed in impact loading tests of steel material to lower the service temperature range over which fully ductile fracture can be obtained.

3323 Desulfurization by Calcium Inoculation Improves Properties of Cast Steel. D. A. Colling and P. J. Ahearn, January 1961, 21pp. Watertown Arsenal Labs., Mass. (Order PB 171 384, price $.75). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Steels with sulfur content as low as 0.001/0.002% were produced in basic induction furnaces by inoculation with Ca-Mn-Si combined with high slag basicity. The effects of initial sulfur content alloy elements and calcium additions for the desulfurization process were assessed. Mechanical properties for low sulfur 4325 and 4340 steels show improved ductility and toughness over normal sulfur steels at the same strength level.

3323 Development of Low Alloy Steel Composition Suitable for High Strength Steel Castings H. L. Larson, R. C. Campbell, H. W. Lloyd, July 1960, 75pp. (Order PB 171 065, price $2.00). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A study was made of heat treatments and compositions for optimum properties in heavy sections of low alloy heat treatable steels and a 5% Crain hardening steel. The influence of high purity melting stock was investigated. Fatigue testing was also performed. Alloy variations of the 5% Crain steel were studied, and elevated temperature properties determined. The effect of feeding distance and soundness of properties of the 5% Crain steel was investigated. Production heat data were analyzed and exhibited good reproducibility as well as superior properties in high purity heats.

3323 Improved Steelmaking Practices Enhance the Mechanical Properties of High Strength Steel Castings. John Zotos, and Kenneth D. Holms. Rodman Lab., Watertown Arsenal, Mass. May 1960, 26pp. (Order PB 149 560, mi $2.70, ph $4.80). Photoduplication Service, Library of Congress, Washington 25, D.C.

Recent advances in the basic—electric and basic—induction atmospheric and vacuum steelmaking practices have, (1) clarified the necessity of minimizing phosphorus and sulfur contents in cast low alloy steels to maximize ductility and toughness at low, medium and high strength levels, (2) shown that the ductility and toughness of these cast steels can be further significantly improved through the use of vaccum melting and casting techniques, and (3) indicated that the mechanical properties of heat treated castings with low sulphur contents compare favorably with the properties of forgings having similar analyses.

3339 Producing Molybdenum Alloys by Kroll Reduction. C. R. Lillie and C. R. Simcoe, Armour Research Foundation, November 1960. 56pp. (Order PB 171 834, price $1.50). U.S. Dept. of Commerce, Office Technical Services, Washington 25, D.C.

The work in this program was aimed at demonstrating the feasibility of producing

alloyed molybdenum directly through co-reduction of mixed chlorides by the Kroll process. Alloys of molybdenum with titanium and with carbon have been successfully produced by this method. The product is not a sponge but a powder, since the reaction takes place in the vapor phase and not the liquid as do most Kroll reductions.

3339 Preparation of Ultra-Fine High Purity Refractory Metal Powders. P. J. Clough, National Research Corp., April 1961. 15pp. (Order AD-256 220, price $1.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Results are reported of an effort to establish procedures for producing ultra-fine high purity powders of the refractory metals. The powders are to have smaller particle size and higher purity than those currently available.

3339 Development of Randomly Oriented Wrought Beryllium Sheet. F. M. Yans, A. K. Wolff, and A. R. Kaufmann, Nuclear Metals, Inc. December 1960, 93pp. (Order AD-258 241, price $2.50). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Various factors affecting texture development in Beryllium were studied in an effort to produce randomly oriented wrought Beryllium sheet. Rolling experiments indicated that the specimen geometry and rolling sequence affected the texture developed during working.

3339 Vaccum Melting of Beryllium by Electron Bombardment. H. T. Somston and G. O. Matthews, Lockheed Aircraft Corp., Dec. 1959. 41pp. (Order PB 171 521, price $1.25). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A process is described for melting and casting beryllium ingots by electron bombardment in order to produce a beryllium or beryllium-alloy ingot for fabrication into plate. Results of various tests are included. It is determined that smooth, homogeneous ingots three inches in diameter and essentially free of casting defects can be produced by the process described.

3361 Application of High Strength Aluminum Castings. M. L. Slawsky and F. A. Heiser, October 1959, 22pp. Watervliet Arsenal, N.Y. (Order PB 171 564, $.75). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

The mechanical properties of aluminum castings can be improved through careful control of foundry variables, particularly iron and contamination, process variation and specialized heat treatment.

3391 High Energy Rate Forging Development. J. M. Palusulich and M. L. Headman, Western Gear Corporation, April 1961, 50pp. (Order AD-255 562, price $7.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Dynapak (high energy rate forging) equipment users have been surveyed and are unanimous in their conviction that high energy rate forging is the greatest advance in forging technology for many decades. High energy rate forging has the potential for; (1) improving quality of forged parts, (2) lowering forging costs, and (3) forging configurations that could not otherwise be produced by conventional forging practices.

3392 A New Type of Lightweight Cellular Material. L. Polonsky and S. Lipson, Pittman-Dunn Labs. Group, Frankford Arsenal, Philadelphia, April 1960, 66pp. (Order PB 161 770, price $1.75). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A process for the production of cellular metals is described. The process consists of preparing a refractory mold, filling the mold with soluble granules which correspond to the size and shape of the pores desired in the metal, and infiltrating the molten metal into this soluble aggregate. In addition to process development which includes casting of shapes as well as billets, a limited investigation of the mechanical and thermal characteristics of aluminum-base cellular metal was made. Potential application for metals of this type are suggested.

SIC-34. FABRICATED METAL PRODUCTS, EXCEPT ORDNANCE, MACHINERY, AND TRANSPORTATION EQUIPMENT

3433 Preliminary Studies on Electric Incinerator Toilets for use Under Remote Arctic Conditions. J. D. Douglas, Arctic Aeromedical Lab. (add. AFB, Alaska. May 1960. 12pp. (PB 150 027, mi $2.40, ph $3.30). Photoduplication Service, Library of Congress, Washington 25, D.C.

It is felt that electric incineration would be an effective and satisfactory means of human waste disposal at remote arctic sites. An electric incinerator toilet which had originally been modified for use aboard aircraft was modified and field tested for possible ground use. Results of the tests indicate that electric incineration would be a feasible means of human waste disposal.

3471 A Study of Metallizing and Chrome Plating Procedures for Reconditioning of Worn Crankshafts. W. L. Williams. Nov. 1960. 26pp. (PB 152 642, mi $2.70, ph $4.80).

Photoduplication Service, Library of Congress, Washington 25, D.C.

The object is to determine the best procedures for reconditioning of worn crankshafts on the basis of minimum loss in fatigue resistance. The experiments in this respect deal with: Determining the optimum fillet form for underact areas in the way of chrome plating; determining the relative effects of out-wire peening and slot peening as procedures to induce residual compressive stresses in the way of plating; and determining whether fatigue resistance is lowered by tempering of induction hardened journal surfaces to a machinable level prior to reconditioning.

3479 The Development of Heat Resistant Paints for Metals. E. L. Huffman, and A. E. Raeuber, Southern Research Institute. Bimonthly progress rpt. 1, Apr. 1961, 9pp. (AD-261 894, price $1.10). Bi-monthly progress rpt. 2, June 1961, 13pp. (AD-261 893, price $1.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

The program objective is the development of coatings which can be applied to metal under field conditions and will protect the metal during normal atmosphere exposure as well as during and after exposure to 1000 degrees F.

SIC-35. MACHINERY EXCEPT ELECTRICAL

3522 Carob: A Possible New Ingredient. R. J. Binder, J. E. Brekke (Fruit and Vegetable Chemistry Laboratory, Pasadena, California). The Mfr. Confectioner 40(1): 25, Jan. 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Western Utilization Research and Development Division, Western Regional Research Laboratory, 800 Buchanan Street, Albany 10, Calif.

Over 60 carob varieties are being experimentally planted in southern California. Studies on processing resulted in a practical method of kibbling and air separation of seeds from pod material.

3522 Effectiveness of Spray Irrigation as a Method for the Disposal of Dairy Plant Wastes. G. W. Lawton, L. E. Engelbert, and G. A. Rohlich (University of Wisconsin), and N. Porges (EURDD). University of Wisconsin, Engineering Experiment Station Res. Rpt. No. 6, pp. 1-59, 1960. 1489. U.S. Dept. of Agriculture, Agricultural Research Service, Eastern Utilization Research and Development Division, 600 East Mermaid Lane, Philadelphia 18, Pa.

Spray irrigation is a practical and economical means of disposing of dairy wastes, provided a suitable soil area is available and reasonable care is exercised in operating the equipment. The principles of spray irrigation and experiences in planning and operating several installations are discussed. Methods for sampling and analyzing waste and soil are given in detail.

3531 Soil Stabilization by Vibration. C. R. White. Naval Civil Engineering Lab., Port Hueneme, Calif. March 1961. 45pp. (PB 171 844, price $1.25). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A theoretical and experimental determination was made of the factors that control vibratory compaction of sand. A 6-1/2 ton vibratory compactor was then designed and built to evaluate the theoretical and experimental findings. The machine effectively compacted sand to depths not previously achieved by conventional compaction equipment. It compacted sand subgrade beneath a flexible pavement while operating on the pavement surface, and it compacted highway base material in fills 20 and 40 inches deep.

3537 Study and Evaluation of Portable Aircraft Maintenance Hoisting Equipment. J. A. Blanco. U.S. Army Transportation Research Command, for Dept. of the Army. Feb. 1961. 19pp. (PB 171 614, price 75 cents). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A portable tripod gantry that can be assembled in 20 minutes and can hoist more than six times its weight has been developed for field maintenance and salvage of Army helicopter components. A six leg 646 lb. gantry costing about $1000 can hoist about 4000 lb. Its steel tripod legs telescoped to accommodate sloping terrain and extend to height of 23 feet.

3541 Chemical Milling. C. H. Rose, Watervliet Arsenal, Watervliet, N. Y. December 1960. 21pp. (PB 171 112, price 75 cents). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Innovations in chemical milling have ushered in an industrial field considered so new in concept and broad in scope that a designer's ingenuity should be his only limitation in exploiting this methodology, according to a process study by the Watervliet Arsenal. While removal of metal through chemical erosion is nothing new, only now, according to the study, have techniques been perfected to apply chemical milling accurately and precisely enough to produce highly complex shapes, nonsymmetrical patterns, intricately stiffened structures, and tapered skin. Highly skilled operators are not required for this process.

Other advantages include economy, adaptability to automation and mass production.

3542 High Temperature Machining Methods. J. L. Wennberg, C. L. Mehl and W. Pentland. Cincinnati Milling Machine Co., May 1961. 157pp. (AD-260 628, price $11.50). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Elevated temperature machining methods and heating techniques were developed to permit effective metal removal. Machinibility of high strength steels, precipitation hardening stainless steels, nickel and cobalt based alloys and some refractory materials is improved at elevated temperatures. Tool life and permissible metal removal rates have been increased very significantly. Detrimental effects on material effects on material can be minimized and are not severe.

3544 Dies for Forming Ferrite Parts. H. Hanft and L. Silber, Microwave Research Institute, Polytechnic Institute, Brooklyn, July 1960. 9pp. (PB 152 724, mi $1.80, ph $1.80). Photoduplication Service, Library of Congress, Washington 25, D.C.

A method for making dies for compression molding of ferrites is described. This technique lends itself to shapes such as those with rectangular holes, which cannot be readily machined.

3544 Evaluation of Numerically Controlled Machining of Forging Dies. A. H. Swift and others, Wyman-Gordon Co. for Aeronautical Systems Center, U.S. Air Force. Sept. 1960. 71pp. (PB 171 378, price $2). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Numerically controlled machining of forging dies results in a superior finish, excellent repeatibility, and greater accuracy, compared with conventional machine die-forging, according to this study.

3545 Non-Metallic Tooling for High Temperature Application. G. E. Connell, J. L. Peters, and W. K. Fosseh. Lockheed Aircraft Corporation, March 1961, 487pp. (AD-257 437, price $26.00). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Commercial castable refractory ceramics can now be economically fabricated into tools for hydro-form blocks, draw dies, and heat treated fixtures, stree relief fixtures, and stretch form dies that will withstand operating temperatures in the 1500-2000°F range for use in fabrication of the newer high temperature alloys.

3548 Explosive Metalworking. (DMIC Memorandum 71) Defense Metals Information Center, Battelle Memorial Institute. November 1960. 30pp. (PB 161 221, price 50 cents). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

The technique of explosive metalworking, a process that uses the detonation of an explosive charge as its energy source, is explained in this Defense Metals Information Center Memorandum. Explosive metalworking requires only a small capital investment and can be used to supplement existing shop equipment for final sizing operations; it can be used to produce large parts and unusual shapes; close tolerances can be held and good uniformity of product obtained.

3548 Joining of Reinforced Plastics with Metal Fasteners. A. Rufolo. Material Lab., New York Naval Shipyard, Brooklyn. Dec. 1957. 39 pp. (PB 145 356, price: mi $3.10, ph $6.30). Photoduplication Service, Library of Congress, Washington 25, D.C.

The problem of construction by joining plastic laminates is attacked by developing a riveting technique and the collecting of design data on the holding strength of screw fasteners. The report includes a field instructors manual giving holding strength of screws in polyester glass laminates.

3551 A Continuous Process for Dehydrating Honey. V. A. Turkot, R. K. Eskew, and J. B. Claffey. Food Technology, 14, 387-390, 1960. 1522. U.S. Dept. of Agriculture, Agricultural Research Service, Eastern Utilization Research and Development Division, 600 East Mermaid Lane, Philadelphia 18, Pa.

A continuous process has been worked out successfully on a pilot-plane scale which produces dried honey having excellent color and flavor and free-flowing granular physical form. Dried honey has been produced in pure form as well as containing various proportions of added sucrose. When held in sealed containers with inpackaged desiccant, the products keep indefinitely at temperatures up to 90 or 100 degrees F. honey "essence" or concentrated aroma of about 100-fold strength has also been made. Commercial outlets envisioned for the dried honey includes its use by commercial and retail bakeries and its incorporation into packaged dry baking mixes for household uses. Costs for a commercial scale plant have been estimated.

3552 Cleaning Cotton by Air. R. A. Hetherwick, and H. W. Weller, Textile Inds. 124, No. 10, 163-165, 1960. 2013. U.S. Dept. of

Agriculture, Agricultural Research Service, Southern Utilization Research and Development Division, Southern Regional Research Lab., 1100 Robert E. Lee Boulevard, New Orleans 19, La.

Research at the Southern Regional Research Laboratory on an improved system for cleaning cotton in textile mills has resulted in development of an aerodynamic type cleaner for use with the SRRL Opener-Cleaner. The new Cleaning unit increases the cleaning efficiency of the Opener-Cleaner by one-third without adverse effects on fibers or yarns.

3552 New Finishes for Easy Care Wool Fabrics. H. P. Lundgren, Modern Textile Mag. 41(6): 53-56. June 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Western Utilization Research and Development Division, Western Regional Research Laboratory, 800 Buchanan Street, Albany 10, Calif.

A review of researches and facilities for research in the Wool and Mohair Laboratory of Western Utilization Research and Development Division of the U.S. Dept. of Agriculture in Albany, Calif.

3554 Continuous Pulping of Wheat Straw for Corrugating Media. T. F. Clark, J. E. Atchison (Parsons and Whittemore, Inc., New York, N. Y.), E. R. Gremler (Pandia Division, Black-Clawson Col., Hamilton, Ohio), TAPPI 43(11): 943-938. November 1960. U.S. Dept. of Agriculture, Agricultural Research Service, Northern Utilization Research and Development Division, 1815 North University, Peoria, Ill.

3562 Development of a Ceramic Roller Bearing. K. M. Taylor, and F. A. Saulino. Carborundum Corp. for USAF. Feb. 1961. 50pp. (AD-261 978, price $1.50). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Ceramic and cermet materials have been tested to determine their suitability in the development of a ceramic roller bearing. Preliminary tests indicated that while life of some of the non-lubricated ceramic bearings were short, some of the lubricated bearings operated successfully at 1000 and 1500 degrees F. for 8 to 28 hours under moderately severe conditions of speed and load.

3562 Cleaning of Ball Bearings. N. Gerber, Naval Ordnance Plant, Indianapolis. 20pp. Final Report (PB 156 317, price $1.60). June 1961. U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Individual ball bearings can be cleaned effectively with ultrasonic energy by either of two methods. Time has not permitted the investigation of continuous or batch cleaning methods. There is some evidence that ultrasonic cleaning equals at least one conventional method. Whether it equals or exceeds in efficiency most conventional cleaning methods remain to be determined.

3564 Porous Stainless Steel Filters for Removing Dust From Hot Gases. L. J. Kane, G. E. Chidester, E. Takack, and C. C. Shale. Bur. of Mines Rept. of Invest. 5842. 18pp. 1961. U.S. Dept. of the Interior, Bureau of Mines—Region V, Morgantown Research Center, P.O. Box 880, Collins Ferry Road, Morgantown, West Virginia.

3566 Development of Gas-Lubricated Bearings for Closed-Cycle Gas-Turbine Rotors. M. W. Eusepiand, D. D. Fuller, Laboratories for Research and Development, Franklin Institute. June 1961, 48pp. (AD-259 285, price $5.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

The development is reviewed of gas bearings for a closed cycle gas-turbine rotor. Design and experimental data are given showing the problems involved in the application of these bearings. The journal bearings and thrust bearing developed for the rotor are externally—pressurized without tilting pads. Each bearing surface is divided into three equal segments by appropriate grooving. Full loads were successfully carried by the bearings under non-notational tests. The gas bearings operate at the same speed and with the same loads as the original oil-lubricated bearings and they fit into the space originally allocated to the oil bearings.

3571 Transistorized Four-Segment Commutator for a Direct-Current Machine. F. L. Schwartz, Massachusetts Institute of Technology for WADD, USAF, Feb. 1960. 40pp. (PB 161 721, price $1.25). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Transistorized two-and four-segment commutators have been developed for the Air Force as part of a program to find a substitute for mechanical commutators in high-speed, high-altitude aircraft.

3585 Cooling Large Electronic Packages. J. G. Moorhead. Diamond Ordnance Fuze Labs. Jan. 1961. 39pp. (PB 171 540, price $1.00). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Investigation of methods of cooling densely packed electronic packages, three cooling

systems are compared: (a) a system employing thermoelectric cooling elements which extend from the package walls to the interior is useless except for very small packages; (b) that the package structure can cool packages of considerable size by thermal conduction through the structure members when the whole package is effectively designed; (c) the size limits of packages cooled by thermal conduction can be significantly increased by placing auxiliary thermoelectric refrigerator units in the package walls.

3585 A New Process for the Production of Fresh Water From Sea Water. H. Svanoe, J. S. Colton (Scientific Design Co., Inc.). and others. Struthers Wells Corp. June 1961. 87pp. (PB 171 840, price $2.25). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

The Struthers Wells–Scientific Design process is a freezing process employing direct contact between saline water and hydrocarbon refrigerant. It differs from other freezing processes principally in using techniques of controlled crystallization to produce large, uniformly sized and regularly shaped (low ratio of surface to volume) pure ice crystals. Skillful conservation of energy is another feature of the process.

SIC-36. ELECTRICAL MACHINERY, EQUIPMENT, AND SUPPLIES

3621 Transistorized Twenty–Pulse Generator. R. W. Leurgans and H. Thiel. Electronic Defense Labs. April 1961, 40pp. (AD-258 863, price $4.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A transistorized multiphase generator is described which was designed, built, and tested to evaluate problems encountered in in miniaturization of multiphase generators. Individual units of the generator are described, and results of various tests are reported. It is concluded that transistorized multiphase generators are feasible, and that thin space and power requirements are considerably reduced over those of a tube–type generator. Cost of Transistorized units is higher, however.

3623 The Investigation of Radioisotopes for the Inspection of Ship Welds. E. L. Criscubio, D. P. Case and D. Polansky, February 1958, 64pp. (PB 161 324, price $1.75). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A study was conducted that explored the potentialities of radioactive isotopes for the inspection of welds in ship structures. For the inspection of welds in 1/2 in. to 1 inch thick plate, iridium is the most promising isotope. A portable exposure container for iridium has been developed.

3662 A Portable Thermistor-Bridge Gas Leak Detector. A. Hafner. Naval Research Lab., July 1961. 18pp. (AD-260 385, price 75¢). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A new portable gas leak detector useful for locating leaks in pressurized systems containing any gas having a thermal conductivity different from that of the air is described. The detector is accoupled and hence does not respond to the gas concentration in the ambient air but only to the change in concentration encountered in the vicinity of a leak.

3679 A Portable Conductivity Meter for use with Electro-Fishing Gear. R. B. Thompson, and R. H. Van Haagen. Progressive Fish-Culturist, 22(2): 63. April 1960. U.S. Dept. of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Biological Laboratory, 2725 Montlake Boulevard, Seattle 2, Washington.

A modified meter for water-conductivity determinations which should precede electrofinishing work is described. The meter's range is from 100 to 300,000 ohms, with an accuracy well within 10 percent of the scale reading in the range of 100 and 50,000 ohms.

3679 Electronic Fishing with Underwater Pulses. H. P. Dale. Electronics, 32(4): 31-33. 1 fig., illus. Jan. 1959. U.S. Dept. of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Biological Laboratory, 2725 Montlake Boulevard, Seattle 2, Washington.

When electrodes are immersed in a stream and pulsed d-c applied, fish in the area are attracted to the positive electrode where they are electronarcotized and easily captured by dip nets. Device obtains population data in waters where nets or other collection means are impractical.

3679 Tests of a Cesium Thermionic Converter Designed to Utilize Solar Energy in Outer Space. V. C. Wilson and J. Lawrence. General Electric Co. Aug. 1960. 25pp. (AD-260 359, price $2.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A cesium thermionic converter with an integral radiator for solar application was designed and tested. Design, construction and processing techniques are discussed. Performance data under various operating conditions are given including a maximum power output at 1800C of 85 watts with 15%

efficiency. The electric generator and reject heat radiator weigh 7.5 lbs. per kilowatt of output electricity.

3679 Product Refinement. Low Power Silicon VHF Transistor. F. Katnack, D. C. Hughes, Jr. and others. Radio Corporation of America. June 1960. (PB 157 667, price $7.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

An n-p-i-n silicon transistor was designed for 100V, 250 megacycle operation. A pilot line process was developed that is suitable for large volume production of the transistor. Devices were fabricated that met both the static and 250 mc requirements specified in the contract. An Automated Device Assembly Machine (ADAM) was demonstrated that gives promise of up to 400 units per hour.

3679 Development of Manufacturing Process for High-Purity Electronic Ceramics. J. H. Battle, E. W. Currier and others. ITT Federal Labs., May 1961, 17pp. (AD-262 279, price $1.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

The purpose of this project is to develop new or improved methods for large scale production of ferroelectric and piezoelectric ceramic materials. A process was developed for producing barium titanate. Preliminary results indicate that this process can be succesfully used to produce material with the desired purity level.

3679 Bureau of Ships Shop Practice Suggestion No. 2. U.S. Navy. November 1960. 24pp. (PB 171 024, price 50¢). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A microswitch circuit checker, designed to stimulate all possible single-circuit combinations for microswitches and plugs; and gage to control "undercut" in welding are among 55 devices and techniques devised by Navy Bureau of Ships employees for saving time and money in machine shop and other industrial operations. These labor-saving recommendations are described in this illustrated report.

3679 Ultrasonic Grinding Techniques in Microminiaturization. J. Krawczyk, Diamond Ordnance Fuze Labs. (AD 261 593, price 75¢). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Ultrasonic impact grinding techniques are shown to be extremely useful in the fabrication of specialty component parts. Machine operation and tool design are discussed and detailed examples are given.

3679 Application of Electron-Beam Machining Techniques to Semiconductors. K. R. Shoulders and D. W. Peters. Stanford Research Institute, for USAF (AD 259 547, price $1.25). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A silicon film has been machined by an electron-beam-activated machining process by using commercial electron-optical and high vacuum apparatus. This process uses an electron beam to produce a chemically resistant layer of silica on the surface of silicon. The unprotected silicon is removed by a molecular beam etching process in a high-vacuum chamber, thus forming a pattern of silicon that conforms to the shape of the electron beam. It is expected that this method of micromachining of semiconductors can be applied to the fabrication of useful microelectronic semiconductor devices.

3679 Electronic Obstacle and Curb Detectors for the Blind. T. A. Benham, Haverford College, June 1960, 206pp. (PB 153 101, mi $9.30 and ph $31.80). Photoduplication Service, Library of Congress, Washington 25, D.C.

An obstacle detector has been built and three units field tested by the blind people over a period of approximately one year. A portable laboratory model of a curb detector has also been built and briefly field tested. It still requires further development to become a practical device.

3679 Development of a Reading Machine for the Blind. Summary Report. W. G. Nolte, and H. A. Mauch, Mauch Labs., Inc. (AD 262 303, price $1.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Work has been directed toward the solution of detail problems in refining the prototype models. A work synthesizer has been completed and fully equipped with magnetic tape fragments containing prerecorded spelled speech letters developed by Professor M. Metfessel of the University of Southern California.

3692 Sea Water Batteries. W. H. Martin, Bell Telephone Labs., Inc. Feb. 1960. 533pp. (PB 146 264, price mi $11.10, ph $81.90). Photoduplication Service, Library of Congress, Washington 25, D.C.

Part One outlines basic research and the general principles of electrochemical and mechanical designs of sea water batteries. Part two describes specific design of sea water batteries, their performance characteristics and the testing program. Part Three covers battery building and related activities such as the development of tools,

facilities and methods for battery production, material procurement, and engineering of the transition to manufacture. Nine appendicies are a selection of technical papers that deal with the electrochemical and hydraulic considerations. Also included are a list of other pertinent memoranda, specifications, and patent applications. The sea water batteries developed under this project employ silver chloride as the active cathode material and magnesium alloy as the anode. Sea water is admitted to the battery by breaking the seals at the time the battery is cut for use.

3693 Ultrasonic Cleaning. S. Cholmar and S. Stambler. Naval Supply Research and Development Facility, Bayonne, N. J. November 1958, 67pp. (PB 147 146, price mi $3.90, ph $10.80). Photoduplication Service, Library of Congress, Washington 25, D.C.

The technical and economic factors involved in the use of ultrasonic cleaning methods were determined. Ultrasonic cleaning is applicable to the cleaning of small critical parts and economical when the savings in labor, solvent costs and increase in efficiency offset the cost of the ultrasonic cleaning equipment. Criteria developed for the use of ultrasonic cleaning methods can be used by interested activities as a guide in determining the applicability of ultrasonic techniques to their cleaning operations.

3694 Research and Development of a Battery Charger. C. B. Todd. Cornell-Dubilier Electric Corp., Indianapolis, Indiana, January 1959, 51pp. (PB 149 703, price mi $3.60, ph $9.30). Photoduplication Service, Library of Congress, Washington 25, D.C.

This report covers research and development and production of prototype for a closely regulated, well filtered, power supply for operation of various communication gear, telephone switchboards, etc., and for the purpose of charging batteries. The power output is 78 VDC or 56 VDC at 1400 watts. Design was successfully completed and prototypes were constructed.

3699 Technique of Applying Electrical Insulating Varnish to Thin Metal Strips. T. M. Pochily, and R. H. Hill. Watervliet Arsenal, U.S. Army. Nov. 1960. 13pp. (AD 261 036, price 50¢). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A technique was developed to apply insulating varnish to electrical conductors having a rectangular cross section 0.093 inches wide by 0.005 inches thick.

3714 Steerable Fifth Wheel. J. E. Thomas and R. L. Schuller, January 1961. 17pp. Army Transportation Research Command, Fort Eustis, Va. (PB 171 613, price 50¢). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

This report covers the testing and evaluation of a device that was designed and constructed for the purpose of evaluating the principle of transverse fifth-wheel motion as a method of facilitating steering in truck-tractor operations. The tests proved that the equivalent of all wheel steering can be accomplished through transverse movement of a fifth wheel mounted on a truck tractor.

3731 Sanitation Aboard Fishing Trawlers Improved by Using Chlorinated Sea Water. Arvey A. Linda, and Joseph W. Slavin. Commercial Fisheries Review, Vol. 22, No. 1, January 1960. p. 19-23 (Separate No. 576). U.S. Dept. of the Interior Fish and Wildlife Service, Bureau of Commercial Fisheries, Technological Laboratory, Emerson Avenue, Gloucester, Mass.

3741 Control Systems for Highway Trains. J. P. Finelli and C. J. Nuttal, Jr. (Wilson, Nuttal, Raimond Engineers, Inc.) Davidson Lab., Stevens Institute of Technology, Hoboken, N. J. September 1960. 81pp. (PB 153 713, price mi $4.80, ph $13.80). Photoduplication Service, Library of Congress, Washington 25, D.C.

Efforts are being made to develop feasible systems for the simultaneous control of multiple engines. These systems are suitable for the application of highway trains, consisting of several 4-wheel units, each with its own power plant. It was concluded that an ideal multiple-engine control system would = (1) permit operation of independent units after separation from the train, (2) permit all controls to be centralized in the lead unit, (3) permit any unit to be used as the lead unit, (4) enable the train to develop its maximum tractive effort, (5) minimize compressive drawbar forces that lead to jackknifing (in all possible circumstances) without sacrificing the ultimate ability of elements to assist one another when necessary, (6) divide normal driving load more or less equally among the engines, (7) control and limit wheel slip for maximum traction or braking, (8) include engine over speed protection, and (9) be as simple, reliable, readily operated, and inexpensive as possible.

3811 Surface Chemical Methods of Displacing Water and/or Oils and Salvaging Flooded Equipment—Part 1—Practical Applications. H. R. Baker and others, U.S. Naval Research Laboratory, Department of the Navy. February 1961. 24pp. (PB 171 479, price 75¢). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Two formulations have been developed for the displacement of fuel oil and for the removal of water from electrical, electronic or mechanical equipment, as the result of a Navy study of chemical methods of removing oil and water and salvaging flooded equipment.

3811 Portable Alpha-Survey Instrument. R. Roach and R. Walker, Lawrence Radiation Laboratory, for U.S. Atomic Energy Commission. April 1961. 9pp. (UCRL 9651, price 50¢). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Radiation control and protection of workers from exposure reportedly can be achieved more cheaply and effectively through use of a new portable type of alpha particle detection instrument developed from U.S. Atomic Energy Commission research.

3821 High-Pressure Research in Metals and Ceramics. R. E. Hoffman and others, General Electric Research Laboratory, for the USAF. Sept. 1960. 72pp. (PB 171 025, price $2.00). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Sections as thin as one-half micron may now be electrochemically removed from lead, according to an Air Force study of high-pressure research in metals and ceramics.

3831 A High Speed Electromechanical Shutter. U.S. Naval Ordnance Laboratory. 60pp. (AD 260 765, price $1.50). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

An electromechanical shutter with submillisecond open time—designed to control the recording period of a medium quartz spectrograph—has been built by scientists at the U.S. Naval Ordnance Laboratory.

3841 Model 16 Automatic Blood Pressure Measuring Instrument. R. A. Johnson, Systems Research Laboratories, Inc., for Wright Air Development Division, USAF. December 1959. 51pp. (PB 161 707, price $1.50). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Development of a small, lightweight, portable instrument capable of automatically monitoring and recording human blood pressure is described in this report. Range of operation is from 100 to 200 mm of mercury and the measurement can be automatically repeated at intervals varying from 1 to 15 minutes. The report includes illustration of the equipment.

3842 Feasibility and Applicability of Roof Washdown System. W. S. Kehrer. Naval Radiological Defense Lab., San Francisco. May 1958, 42pp. (PB 144 801, price mi $3.30, ph $7.80). Photoduplication Service, Library of Congress, Washington 25, D.C.

The feasibility and applicability of a washdown or water curtain system against radioactive fallout for building roofs was evaluated, based on the results of a water requirements experiment plus presently available information. The system was found to be both feasible and applicable. The evaluation is based on commercially available components, including the test surfaces. However, some thoughts are also given on a general design of buildings and roofing surfaces to be developed to obtain optimum roof washing effectiveness.

3851 Method for Producing Wettable Surfaces on Contact Lenses by Chemical Formation of Inorganic Films. Robert A. Erb, Franklin Institute (Labs. for Research and Development). March 1961, 13pp. (AD 257 290, price 50¢). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

Wettable surfaces of a permanent nature can be produced on contact lenses by means of the technique of chemical deposition of an inorganic film on the lens surface. The process is simpler, both in apparatus and procedure, than the vacuum deposition technique designed earlier for producing wettable surfaces on plastic lenses; the new process should have wide application. This report summarizes the factors involved in the process of coating a poly (methyl methacrylate) substrate with a thin film of titanium dioxide which has the properties desired—that is, transparency, wettability, adhesion, and immersion resistance. Stepwise instructions are given for the preparation of hydrophilic surfaces on contact lenses. The equipment developed for this work is relatively simple and inexpensive.

3861 Operating Instructions, Folded Cut-Film Smear Camera. P. Donovan and D. McLanahan, Naval Ordnance Laboratory, for Dept. of the Navy. March 1961. 27pp. (PB

171 818, price $1.00). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

A new smear camera adapted to use Polaroid film which can take an estimated 10 times as many shots per working day than its predecessor has been developed by the Navy.

3861 Estimating the Area in Logging Roads by Dot Sampling on Aerial Photos. K. E. Moessner, Research Note 76, 6pp. 1960. U.S. Dept. of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, Ogden, Utah.

SIC-39. MISCELLANEOUS MANUFACTURING INDUSTRIES

3999 California Manzanita for Smoking Pipes. Hereford Garland and Lois Marion, Pacific Southwest Forest and Range Expt. Stat. Tech. Paper 53. 12pp., illus. U.S. Dept. of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station, 1960 Addison Street, Post Office Box 245, Berkeley 1, Calif.

Discusses use of briarwood for pipes and presents historical background. Describes manzanita and range of burl-forming species. Extraction and processing of burls into rough pipe blocks are outlined.

SIC-49. ELECTRIC, GAS, AND SANITARY SERVICES

4911 Development of a Semiconductor Film-Type Thermocouple Energy Converter. Honeywell Research Center, April 1961. 17pp. (AD 258 075, price $1.60). U.S. Dept. of Commerce, Office of Technical Services, Washington 25, D.C.

An oxide thermoelectric generator was constructed. The properties of this generator are described. The unit establishes the usefulness of oxide thermoelectrics in application where voltage at low current levels is required.

4925 Gasification of Pulverized Coal at Atmospheric Pressure: Discussion of Pilot-Plant Development, Study of Process Variables and Relative Gasification Characteristics of Coals of Different Rank. G. R. Strimbeck, J. H. Holden, F. Bonar, K. D. Plants, D.D. Pears, and L.L. Hirst. Bureau of Mines Rept. of Investigation 5559, 68 pp. 1960. U.S. Dept. of the Interior, Bureau of Mines—Region V, Morgantown Research Center, P.O. Box 880, Collins Ferry Road, Morgantown, West Virginia.

SIC-50. WHOLESALE TRADE

5049 Processing of Pistachio Nuts. Felix Bloch and J. E. Brekke, Econ. Bot. 14(2): 129-144, April-June, 1960. (1196). U.S. Dept. of Agriculture, Agricultural Research Service, Western Utilization Research and Development Division, Western Regional Research Laboratory, 800 Buchanan Street, Albany 10, Calif.

A report of new methods for dehulling, separation of split and unsplit nuts, grading, drying, salting, and roasting. Composition data and moisture equilibrium curves are included.

SIC-73. MISCELLANEOUS BUSINESS SERVICES

7392 Statistical Tolerance Limits. W. G. Ireson, B. E. Smith, G. J. Resnikoff (Illinois Institute of Technology) Applied Mathematics and Statistics Lab., Stanford Univ., May 1960, 45pp. (PB 148 095, price mi $3.30, ph $7.80). Photoduplication Service, Library of Congress, Washington 25, D.C.

A study is presented to illustrate the application of a statistical technique to the problem of setting specifications to be held in the manufacturing of an industrial product. A means of directly determining one-sided and two-sided tolerance limits is discussed when the characteristic under study is approximately normally distributed.

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